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Article XX.—THE ANTS OF THE BERMUDAS.

By WILLIAM MORTON WHEELER.

Professor Trevor Kincaid has recently sent me a small collection of ants, the study of which affords an opportunity of bringing together the little that is known concerning the ant-fauna of the Bermuda Islands. In this undertaking I have been materially aided by Professor A. E. Verrill's comprehensive work,¹ in which he has collected the scattered references to the Formicidæ. These references, together with the specimens taken by Professor Kincaid, indicate that the ant-fauna of the Bermudas is extremely meager. This is not surprising when we stop to consider the geological history of these isolated islands and the fact that their present terrestrial fauna and flora is very largely, if not exclusively, made up of species that have been introduced since glacial times by commerce or by purely accidental agencies. The ants certainly belong to widely distributed species, several of which have made their way as well-known tramps or stow-aways to many other islands besides the Bermudas. Even the single new species (*Prenolepis kincaidi*) described in the present paper is probably of West Indian origin.

There seem to have been times in the history of the Bermudas, however, when the ants made up in number of individuals for what they lacked in variety of species. This is shown by the extracts quoted by Professor Verrill from the works of Governor Butler² and Hurdis.³

In the following quaint passage Governor Butler mentions certain ants which were making the lives of the inhabitants uncomfortable as early as the beginning of the seventeenth century: "The moscitos and flies also are somewhat over busie, with a certain Indian bugge called, by a Spanish appellation a caca-roche, the which, creepeinge into chestes and boxes, eate and defile with their dung (and thence their Spanish name) all they meet with; as doe likewise the little aunt, which are in summer time in infinite numbers; worms in the earth and mould also, ther are but too many (but of them we shall saye

¹ The Bermuda Islands, an Account of their Scenery, Climate, Productions, Physiography, Natural History, and Geology, with Sketches of their Discovery and Early History, and the Changes in their Flora and Fauna due to Man, with 38 Plates and over 250 Cuts in the Text. Reprinted from the Trans. Connecticut Acad. Sci., Vol. XI, with some changes. New Haven, Conn. 1902.

² Gov. Nathaniel Butler. Historye of the Bermudaes, 1609-22.

³ John L. Hurdis. Rough Notes and Memoranda relating to the Natural History of the Bermudas. Edited by H. J. Hurdis from MS. notes mostly made from 1847-1855. London, 1897.

somewhat more by and by), as likewise the grass-hopper, and a certain sommer-singing great fly, the sure token of the established springe (and in that respect as the English nightingale and cuckoo), whose loud note very much resemblinge the whirle of a spindle, hath caused herselfe thereby to be called the good-huswife." Hurdis mentions two species of Formicidæ, a house-ant and another ant of larger size which he supposed to be of West Indian origin: "Hill and dale and even the dwellings of men were equally alive with this insect pest. Dense columns of them might be seen travelling up and down every tree, and great was the havoc they occasioned among young pigeons and poultry, nor did the full-grown domestic rabbit escape their deadly attack, and pigs were sometimes destroyed by them." It is, of course, impossible to identify the species from these quotations. Hurdis's account may refer to the tropicopolitan fire-ant (*Solenopsis geminata*) or to *Monomorium destructor*, but whether he refers to one of these or to some other species, it is certainly of interest that no such species can be recognized among those enumerated by subsequent writers. He mentions the fact that the ant, after infesting Bermuda to a "fearful degree" for seven consecutive summers previous to 1848, was greatly reduced in numbers from some unknown cause. We must conclude that it has since become extinct or, at any rate, so rare as to have escaped the notice of subsequent collectors like Professor Verrill and Professor Kincaid. The supplanting of one species of ant by another is not unknown on other islands as I have shown in a recent paper.¹ In Madeira, for example, according to Stoll,² *Pheidole megacephala*, which was extremely abundant in the first half of the nineteenth century, as we learn from the careful work of Heer,³ has been displaced by another tramp species, *Iridomyrmex humilis*. Stoll has also called attention to the extermination of the indigenous ant-fauna of the island of Reunion by *Plagiolepis longipes* of Cochin China.

If we omit the ants mentioned by Hurdis as unrecognizable, the following list comprises all the species known from the Bermudas:

Subfamily PONERINÆ.

1. *Ponera opaciceps* Mayr.—A dealated female and five workers collected by Professor Kincaid belong to the typical form of this species.

¹On Certain Tropical Ants Introduced into the United States. Entomol. News, Jan., 1906, pp. 23-26.

²Zur Kenntniss der geographischen Verbreitung der Ameisen. Mittheil. d. Schweiz. entomol. Gesell., X, 3, 1898, pp. 120-126.

³Ueber die Hausameise Madeiras. An die Züricher Jugend auf das Jahr 1852 v. d. naturforsch. Gesell. 54. Stück, 1852, pp. 1-24, 1 Taf.

2. *Odontomachus hæmatodes insularis* Guérin.—This is evidently the form mentioned by Dahl¹ as *Odontomachus* sp. Among the material collected by Professor Kincaid during July, 1905, are a dealated female and several workers closely resembling in color, sculpture and pilosity the Bahaman variety of *insularis* which I have called *ruginodis*.

Subfamily MYRMICINÆ.

3. *Monomorium pharaonis* Linn.—I am inclined to believe that this cosmopolitan house-ant is the one mentioned by Professor Verrill as occurring in the Bermudas, and not *M. minutum*, of which he reproduces Marlatt's figure. The latter species is not a house-ant.

4. *Cardiocondyla emeryi* Forcl.—A worker and two males collected by Professor Kincaid.

5. *Pheidole megacephala* Fabr.—This species was found in Bermuda by Dahl, who, like Professor Verrill, mentions it under the name of *Ph. pusilla* Heer. Professor Kincaid has sent me several males, winged and dealated females, soldiers and workers taken from at least four different colonies, and Prof. J. H. Comstock has sent me a soldier and worker. Professor Verrill mentions specimens from St. David's Island. It is probably very common throughout the Bermudas and may be responsible for the small number of species in the islands. It is not, however, a native of Madeira, as Professor Verrill states, but a well-known tropicopolitan ant, which, as above stated, overran that island in the first half of the nineteenth century. There can be little doubt that wherever it gains a foothold in tropical or subtropical countries it is able to propagate very rapidly, and to exterminate the indigenous ant-fauna. I have recently seen a good illustration of its habits in the Virgin Islands. During the past March I devoted ten days to a careful study of the ant-fauna of the little island of Culebra off the eastern coast of Porto Rico without seeing a single specimen of *Ph. megacephala*. This island is, however, completely overrun with a dark variety of the vicious fire-ant (*Solenopsis geminata*). One day, on visiting the island of Culebrita, which is separated by a shallow channel hardly a mile in width from the eastern coast of Culebra, I was astonished to find it completely overrun with *Ph. megacephala*. This ant was nesting under every stone and log, from the shifting sand of the sea-beach to the walls of the lighthouse on the highest point of the island. The most careful search failed to reveal the presence of any other species of ant, though

¹ Die Landfauna von Bermuda, in: Krummel, Reisebeschr. d. Plankton-Expedition. 1902, pp. 105-112, 1 Taf.

the flora and physical conditions are the same as those of Culebra! It is highly probable that *Ph. megacephala*, perhaps accidentally introduced from the island of St. Thomas a few miles to the east, had exterminated all the other ants which must have previously inhabited Culebrita. The absence of *megacephala* on Culebra is perhaps to be explained by the presence of the equally prolific and pugnacious fire-ant.

6. *Tetramorium cæspitum* Linn.—Professor Verrill says that he has recognized this species in the Bermudas. We should have expected the tropicopolitan *T. guineense* Fabr. instead, and venture to doubt the correctness of his identification. Although *T. cæspitum* has been introduced into the United States, I believe there is no record of its introduction into a subtropical country. *T. guineense*, however, is a well-known tramp species, occasionally found even in our northern hot-houses.

Subfamily CAMPONOTINÆ.

7. *Brachymyrmex heeri* Forel.—Numerous workers, winged females and males of the typical form of this diminutive ant were collected during July from two colonies by Professor Kincaid. This species together with the following variety has probably been introduced with plants from its original home in the West Indies.

8. *Brachymyrmex heeri* Forel var. *obscurior* Forel.—Three workers collected by Professor Kincaid.

9. *Prenolepis kincaidi* sp. nov.

Worker. Length 1.3–1.5 mm.

Head rectangular, a little longer than broad, as broad in front as behind. Eyes flattened. Clypeus very convex, subcarinate, its anterior border emarginate in the middle. Front with a transverse welt or swelling between the antennal insertions. Antennæ slender, scapes extending a little more than $\frac{1}{2}$ their length beyond the posterior corners of the head. Thorax robust; pro- and mesonotum of about equal length; mesoepinotal depression rather shallow and much shorter than the distance between the two stigmata. Epinotum rounded in front, flattened behind, without a distinct angle between the basal and declivous surfaces. Petiole small and narrow, with a blunt and rounded node. Gaster of the usual shape. Legs rather long.

Surface of body, especially the pleuræ, smooth and shining, without perceptible sculpture.

Hairs black, erect, obtuse and abundant on the head, thorax and gaster, more scattered on the legs. The antennal scapes have a few erect white hairs. Pubescence white, very sparse and visible only on the head and legs.

Body dark brown, head and gaster blackish above; antennæ, mouthparts, tibiæ and tarsi yellow.

Female. Length 3.5 mm.

Head about as long as broad, narrower in front than behind, with a straight posterior border. Clypeus convex, distinctly carinate, its anterior border very faintly emarginate in the middle. Antennal scapes extending about $\frac{1}{2}$ their length beyond the posterior corners of the head. Front with a transverse ridge between the antennal insertions. Thorax robust, but little broader than the head, flattened above. Epinotum very sloping. Petiole much inclined forward, its posterior surface convex, its upper border sharp and feebly notched in the middle.

Subopaque; thorax, cheeks and posterior corners of the head smooth and shining.

Hairs like those of the worker but proportionally shorter. Pubescence gray, dense, especially on the gaster.

Dark brown; thorax paler, insertions of the wings, sutures and mouthparts yellow, as are also the tarsi and the articulations of the legs and antennæ. Wings grayish hyaline; veins brownish; stigma well-developed, dark brown.



FIG. 1. *Prenolepis kincaidi* sp. nov. Male. a, outer; b, median, and c, inner genital valve.

Male. Length 2.3 mm.

Mandibles with an apical and a smaller subapical tooth. Thorax short, robust, with faintly rounded epinotum. Body shining. Pilosity and coloration as in the worker. Legs slender. Wings like those of the female but without a distinct stigma. Outer genital valves long, slender, and distinctly curved inward, with a blunt point and abundant but rather short hairs (Fig. 1, a). Outer process of median valve digitiform, somewhat bent in the middle and with the papillate surface at its tip; inner process nearly twice as long as the outer, slender and tapering, geniculate near its base and with the papillate surface on its basal half some distance from the slender tip (Fig. 1, b). Inner valve large, apparently twisted, and tapering to a blunt point like that of the outer valve (Fig. 1, c).

Described from four workers, two females and a single male taken from the same colony June 26, 1905, by Professor Kincaid.

I have described this species as new because I fail to find anything like it among the described American or Old World species of *Prenolepis*. In certain respects it resembles *P. anthracina* of Cuba, but

Roger's description of this species is too meager to admit of identification. *P. kincaidi* is evidently allied to *P. vividula* Nyl. and *P. bruesi* Wheeler, but the genital valves of the male are very different.

10. *Prenolepis* sp.—Seven workers, apparently all from the same colony, but varying much in size (from 2–3 mm.) They are very pilose and pubescent, with subopaque surface and finely punctate mesonotum. The species cannot be identified without the corresponding male, for, as Forel has shown, the only satisfactory diagnostic characters of the species in the difficult genus *Prenolepis* are to be found in the genital valves of that sex.

11. *Lasius niger* Linn.—This form is mentioned by Kirby¹ under its old name *Formica nigra* Linn. as occurring in the Bermudas. It was probably introduced, as he says, but whether from Europe or the United States it is impossible to ascertain.

¹On the Hymenoptera Collected during the Recent Expedition of H. M. S. "Challenger." Ann. Mag. Nat. Hist., ser. 5, XLIII, 1884, pp. 403–413.